Rare-earth Information Center INSIGHT

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Volume 3 | December 1, 1990 | No. 12

Free Rare Earths!

Kerr-McGee Chemical Corp., which is decommissioning its former West Chicago, Illinois thorium and rare earth processing facility, is making available almost one million pounds of a variety of rare earth materials at no cost except for shipping. About two-thirds of the stockpile consists of two products: neodymium oxalate (~328,000 pounds) and yttrium fluoride (~293,000 pounds). The remaining one-third consists of other individual rare earth compounds, such as ceric oxide, lanthanum oxalate and other neodymium and yttrium compounds, and also mixtures of rare earths, such as samarium/gadolinium oxide, didymium compounds, heavy rare earth oxides and monazite. In addition they have some thorium materials. The rare earth and thorium products are packed in drums and are assayed with respect to their Th^{232}. The rare earth products are grouped into three grades with respect to their thorium content: less than 0.05%Th, between 0.05 and 0.25%Th and greater than 0.25%Th. To obtain further information about these materials contact: Mark Krippel, Plant Manager/Health Physicist, Kerr-McGee Chemical Corporation, 798 Factory Street, West Chicago, IL 60185; Tel: (708)231-0762 and Fax: (708)231-3990.

If you are interested in these materials, we suggest you contact Mr. Krippel soon, because this information will appear in the **RIC News**, which will be in the mails a few days after you receive this issue of **RIC Insight**.

Neodymium Scrap Recovery

A new process developed at the Ames Laboratory, Iowa State University (ISU) to recover neodymium scrap accumulated in the manufacture of Nd-Fe-B permanent magnets has been licensed to Ames Specialty Metals, a division of Edge Technologies, Inc. After the initial development, the process was scaled-up to an industrial size process and demonstrated to be economically feasible at the Center for Advanced Technology Development, Institute for Physical Research and Technology, ISU. Patent applications have been filed by the ISU Research Foundation, and so no detailed information concerning this process is currently available. Rare earth permanent magnet manufacturers have a great interest in this process, since as much as 30 percent of the material used to make the Nd-Fe-B permanent magnets ends up as scrap from the grinding and cutting operations, and most of this scrap has been piling up in their production facilities. The equipment to recover neodymium from the magnet material has been installed, and Ames Specialty Metals anticipates that they will be returning neodymium or neodymium alloys to the magnet manufacturers by the end of 1990 -- just a few days away. The recovered neodymium will be significantly cheaper than the initial neodymium prepared from the oxide or halide. For more information contact Hal Dorman, Ames Specialty Metals, 306 S. 16th Street, Ames, IA 50010; Tel: (515)294-3164 and fax: (515)232-1177.

Murray Basin, Western Victoria Deposit

Preliminary estimates of the monazite and xenotime contents of the Murray Basin heavy mineral deposit indicate that the amounts of these two rare earth minerals are about seven times larger than the current proven reserves of rare earths in Australia. The Murray Basin deposit is being evaluated by Wimmera Industrial Minerals Pty. Limited, a subsidiary of CRA Limited. The deposit will be mined primarily for zircon and titanium minerals, but significant quantities of rare earths would also be extracted. The first deposit, WIM-150, contains 300,000 tons of monazite (which is down by almost a factor of two from an earlier estimate reported in September 1, 1989 issue of **RIC Insight**, 2 [9]) and 170,000 tons of xenotime (same as given earlier). Initial estimates of the four other deposits of the Murray Basin indicate about six times the amount of rare earths in the WIM-150 deposit.

Rare Earth Permanent Magnet Developments

A paper by H. H. Stadelmaier on the "Summary of Magnet Developments in the Past Two Years" just appeared in print in **J. Mater. Eng.** 12, 185-193 (1990). This article was based on a paper presented by the author at the 1989 ASM (American Society for Materials) Seminar on Hard and Soft Magnetic Materials, held in Indianapolis, Indiana in October. The author discusses the Mn-Al-C alloy, the $R_2T_{14}X$ (T=Fe or Co and X=B or C) materials, phases with ThM_{12}-type structure, and other materials. He noted that recent research had followed four different paths: 1) improvement of Nd-Fe-B by alloying and processing, 2) exploring other alloy systems which are isostructural with $Nd_2Fe_{14}B$, 3) systematic study of new families of possible permanent magnets, and 4) characterization of phases that are present in the known systems and contribute to the coercivity. Eighty-eight references are cited in Stadelmaier's review.

High T_C Superconductor Helps Image a Human Brain

In the September 27, 1990 issue of **Nature**, **347**, 317, a photograph of the "first image of a human brain" produced by magnetic resonance imaging (MRI) using a high temperature superconductor pick-up coil was presented. The coil was made out of the $YBa_2Cu_3O_{7-x}$ (1:2:3) superconductor and it replaced the usual copper pick-up coil. The 1:2:3 coil has a significantly greater sensitivity than copper, giving a higher signal-to-noise ratio. The use of the 1:2:3 coils in MRI should enable technicians to decrease the number of scans needed to produce a satisfactory image and thus reduce the costs to the patient.

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